

Serial No.: 09/500,555

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Version Showing Changes in the Amendment

1. (amended) An array composition comprising:

- a) a substrate with a surface comprising discrete sites; [and]
- b) a population of microspheres comprising at least a first and a second subpopulation, wherein each subpopulation comprises a bioactive agent; and
- c) at least one fiducial, [;]
wherein said microspheres are distributed on said surface.

3. (amended) An array composition according to claim 1 wherein each subpopulation comprises an identifier binding ligand that will bind a decoder binding ligand for identification and elucidation of the bioactive agent [such that the identification of the bioactive agent can be elucidated.]

19. (amended) A method according to claim 18 wherein said subpopulations further comprise an identifier binding ligand that will bind a decoder binding ligand for identification and elucidation of the bioactive agent [such that the identification of the bioactive agent can be elucidated.]

20. (amended) A method according to claim 18 wherein said subpopulations further comprise an optical signature for identification and elucidation of the bioactive agent [such that the identification of the bioactive agent can be elucidated.]

28. (new) A composition according to claim 1, wherein said discrete sites are wells.

29. (new) A composition according to claim 1, wherein said microspheres are randomly distributed on said substrate.

30. (new) A method according to claim 18, wherein said discrete sites are wells.

31. (new) A method according to claim 18, wherein said microspheres are randomly distributed on said substrate.

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Pending claims

1. (amended) An array composition comprising:
 - a) a substrate with a surface comprising discrete sites;
 - b) a population of microspheres comprising at least a first and a second subpopulation, wherein each subpopulation comprises a bioactive agent; and
 - c) at least one fiducial, wherein said microspheres are distributed on said surface.
2. An array composition according to claim 1 wherein each subpopulation comprises a unique optical signature.
- 3.(amended) An array composition according to claim 1 wherein each subpopulation comprises an identifier binding ligand that will bind a decoder binding ligand for identification and elucidation of the bioactive agent.
4. An array composition according to claim 1 wherein said substrate is a fiber optic bundle and said fiducial is a fiducial fiber.
5. An array composition according to claim 1 wherein said substrate is a fiber optic bundle, said array comprises at least three non-linear fiducial, and each of said fiducial is a fiducial fiber.
6. An array composition according to claim 5 wherein at least one of said fiducial fibers has a different shape from the others.
7. An array composition according to claim 1 wherein said fiducial is a defined edge of said substrate.
8. An array composition according to claim 1 wherein said fiducial is a fiducial bead.
9. An array composition according to claim 1 wherein said bioactive agents are nucleic acids.
10. An array composition according to claim 1 wherein said bioactive agents are proteins.
11. An array composition according to claim 1 further comprising a computer readable memory comprising:
 - a) computer code that receives a first data image; and
 - b) computer code that registers said first data image using said fiducial to generate a first registered data image.

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12. An array composition according to claim 11 wherein said computer readable memory further comprises:

- a) computer code that receives a second data image;
- b) computer code that registers said second data image using said fiducial to generate a second registered data image; and
- c) computer code that compares said first and said second data image.

18. A method of making an array composition comprising:

- a) forming a surface comprising individual sites on a substrate;
- b) distributing microspheres on said surface such that said individual sites contain microspheres, wherein said microspheres comprise at least a first and a second subpopulations each comprising a bioactive agent; and
- c) incorporating at least one fiducial onto said surface.

19. (amended) A method according to claim 18 wherein said subpopulations further comprise an identifier binding ligand that will bind a decoder binding ligand for identification and elucidation of the bioactive agent.

20. (amended) A method according to claim 18 wherein said subpopulations further comprise an optical signature for identification and elucidation of the bioactive agent.

21. A method according to claim 18 wherein said substrate is a fiber optic bundle and said fiducial is a fiducial fiber.

22. A method according to claim 18 wherein said substrate is a fiber optic bundle, said array comprises at least three non-linear fiducial, and each of said fiducial is a fiducial fiber.

23. A method according to claim 122 wherein at least one of said fiducial fibers has a different shape from the others.

24. A method according to claim 18 wherein said fiducial is a defined edge of said substrate.

25. A method according to claim 18 wherein said fiducial is a fiducial bead.

26. A method according to claim 18 wherein said bioactive agents are nucleic acids.

27. A method according to claim 18 wherein said bioactive agents are proteins.

28. (new) A composition according to claim 1, wherein said discrete sites are wells.

29. (new) A composition according to claim 1, wherein said microspheres are randomly distributed on said substrate.

30. (new) A method according to claim 18, wherein said discrete sites are wells.

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31. (new) A method according to claim 18, wherein said microspheres are randomly distributed on said substrate.